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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,429	09/21/2005	Matthias Fink	28944/50001	3337

7590   10/09/2007
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EXAMINER
HUGHES, SCOTT A

ART UNIT	PAPER NUMBER
3663	

MAIL DATE	DELIVERY MODE
10/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>25 July 2007</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>25 July 2007</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments and amendments filed 7/25/2007 with respect to the rejections under 35 USC 112 are persuasive, and these rejections are withdrawn.

Applicant's arguments and amendments filed 7/25/2007 with respect to the rejections under 35 USC 101 are persuasive, and these rejections are withdrawn.

Applicant's submission of the English language for the Aubry reference is sufficient to overcome the objection to the IDS.

Applicant's amendments to the drawings are sufficient to overcome the objection to the drawings.

Applicant's arguments with respect to the rejection under 35 USC 102 of claims 1-2, and 5-13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack (5696737) in view of Sallas (5721710)

With regard to claim 1, Hossack discloses responses of a medium in relation to

the transmission of waves between different points (Column 1, Line 55 to Column 2,

Line 27; Column 3, Lines 10-60; Column 12, Line 45 to Column 14, Line 56). Hossack

discloses: (a) at least one step of emission in the course of which waves are emitted

into the medium by generating signals $e_i(t)$ on the basis of a number N of emission

points included in the medium, where N is an integer at least equal to 2 and i is an index

lying between 1 and N which designates one of said N emission points (each transducer

in array 16) (Fig. 1), (b) at least one step of reception in the course of which signals $r_j(t)$

are picked up from said waves after transmission in said medium, at a number M of

reception points included in the medium, where M is a non-zero natural integer and j is

an index lying between 1 and M which designates one of said M reception points

(transducers in array 16 when used to receive signals) (Column 3), (c) and using

responses $h_{ij}(t)$ between each emission point i and each reception point j on the basis

of the signals emitted $e_i(t)$ and picked up $r_j(t)$ (Column 1, Line 55 to Column 2, Line 27;

Column 3, Lines 10-60; Column 12, Line 45 to Column 14, Line 56). Hossack discloses

that during the course of step (a), said N emission points are made to simultaneously

emit the signals $e_i(t)$, these signals $e_i(t)$ having a duration T and each being a sum of n

substantially monochromatic elementary signals, of like amplitude and of respective

frequencies $f_{0,i+k}.\Delta f$, where $f_{0,i}$ is a predetermined eigenfrequency

(harmonic) at the point i, k is an integer lying between 0 and n, n is an integer at least

equal to 2 and Δf is a predetermined frequency interval, the respective

eigenfrequencies $f_{0,i}$ at the various points i being distinct and lying in a frequency

band of width .delta.f, and using an impulse response filter on the signal ei(t) emitted at the point i and the signal rj(t) picked up at the point j (Column 1, Line 55 to Column 2, Line 27; Column 3, Lines 10-60; Columns 4-10 dealing with transmission of frequencies from transducers; Column 12, Line 45 to Column 14, Line 56) (Figs. 7-10, 16-20). Hoassack does not specifically disclose calculating the impulse response from the waves emitted and received in the medium. Sallas teaches transmitting and receiving acoustic signals to determine properties of a structure being imaged, and teaches determination of impulse responses hij(t) between emission points i and each reception points j on the basis of the signals emitted ei(t) and picked up rj(t), wherein each impulse response hij(t) is calculated on the basis of a signal of correlation between the signal ei(t) emitted at the point i and the signal rj(t) picked up at the point j (Column 4, Line 35 to Column 5, Line 15; Column 6, Line 62 to Column 7, Line 44; Column 9, Line 49 to Column 10, Line 67; Column 15, lines 14-25; Column 19). It would have been obvious to modify Hossack to include calculating the impulse response of the medium from the correlation of the received and transmitted waveforms as taught by Sallas in order to determine the properties of the medium so that the frequency range needed to image the medium can be optimized.

With regard to claim 2, Hossack discloses that the respective eigenfrequencies f.sub.0,i at the various points i are separated pairwise by an offset .delta.f/N (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 5, Hossack discloses that the waves transmitted in the medium between the emission points and the reception points are acoustic waves (abstract; Columns 1,3,12).

With regard to claim 6, Hossack discloses that in the course of step (a), the medium where the waves are emitted is reverberant (Columns 1-3).

With regard to claim 7, Hossack discloses that the frequency interval .delta.f is less than or equal to 1/.tau., where .tau. is the temporal dispersion of the medium (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 8, Hossack discloses that the frequency interval .delta.f is substantially equal to 1/.tau., where .tau. is the temporal dispersion of the medium (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 9, Hossack discloses that the duration T is at least equal to N/.delta.f (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 10, Hossack discloses that the duration T is at least equal to N..tau., where .tau. is the temporal dispersion of the medium (Columns 4-6) (Figs. 7-10, 16-20).

With regard to claim 11, Hossack discloses that the elementary signals exhibit random phases (Column 4, Lines 1-20). Hossack discloses that the phases can have errors, and therefore they are random.

With regard to claim 12, Hossack discloses that the waves are emitted with a certain passband, the frequencies f0i comprise a minimum frequency f0 and the number n is determined so that the frequency band lying between f0 and f0+[(n+1)..delta.f]

substantially overlaps said passband (Column 1, Line 55 to Column 2, Line 27; Column

3, Lines 10-60; Columns 4-10 dealing with transmission of frequencies from

transducers; Column 12, Line 45 to Column 14, Line 56) (Figs. 7-10, 16-20)..

With regard to claim 13, the method as claimed in claim 1, in which the reception

points are coincident with the emission points (transducers 16) (Fig.1).

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hossack (5696737) in view of Sallas (5721710) as applied to claim 1 above, and further

in view of Panasik (IEEE July 1976).

With regards to claims 3-4, Hossack and Sallas do not disclose the specifics of

calculating the impulse response using a gate function. Panasik teaches that it is

known to use a gate function when calculating impulse response (245-246). It would .

have been obvious to modify Hossack and Sallas to include using a gate function in

order to minimize data by windowing the data. From the disclosure of Sallas and

Panasik (239-246), applicant's equations for determining impulse response appear to

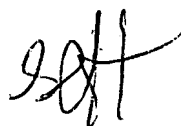be the normal mathematical calculations required to determine impulse response.

Conclusion

The cited prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAH

JACK KEITH
SUPERVISORY PATENT EXAMINER